

## Studies on plants used in traditional medicine by *Bhilla* tribe of Maharashtra

S Y Kamble<sup>1\*</sup>, S R Patil<sup>1</sup>, P S Sawant<sup>2</sup>, Sangita Sawant<sup>3</sup>, S G Pawar<sup>1</sup>, & E A Singh<sup>4</sup>

<sup>1</sup>Bharati Vidyapeeth University, Yashwantrao Mohite College, Pune 411 038, Maharashtra

<sup>2</sup>Bharati Vidyapeeth University, College of Ayurved, Pune 411 043, Maharashtra

<sup>3</sup>School of Health Sciences, University of Pune, Pune 411 007, Maharashtra

<sup>4</sup>Rajiv Gandhi Institute of IT and BT, Dhankwadi, Pune 411 043, Maharashtra

E-mail: bvuniversity@yahoo.co.in

Received 22 April 2009; revised 25 August 2009

Since ancient times, plants are being used as medicines, foods, agrochemicals and pharmaceuticals by large number of tribal, rural and urban people. India has more than 300 tribal communities. In Maharashtra, there are 20 major tribes. Though, there has been good research work on tribals of India including Maharashtra, some of the tribes, and tribal region of Maharashtra have not received proper attention of researchers. *Bhilla* tribe is one of them and they are inhabited in Dhule, Jalgaon and Nandurbar districts of Maharashtra. Therefore, survey of ethnomedicinal plants used by *Bhilla* tribe was undertaken. Analysis of data revealed that a total number of 127 plants species belonging to 116 genera and 59 families of flowering plants, and ferns are being used by *Bhilla* tribe for medicinal purposes. Out of 127 species used by them, 27 species are new reports of less known uses of medicinal plants from this region.

**Keyword:** *Bhilla* tribe, Traditional medicine, Ethnomedicine, Maharashtra

**IPC Int. Cl.<sup>8</sup>:** A61K36/00, A01G1/04, A01G1/14, A01G5/00, A01G5/50, A01G9/14, A01G29/00, A01G39/02

Since the existence of human civilization, plants and their by products are being used by large number of population living in urban as well as rural, and remote areas for various purposes such as medicine, healthcare, food, clothing, shelter, agriculture, agrochemicals, pharmaceuticals, narcotics, etc. In the beginning, the sources of medicine were exclusively from plants. More than 7,000 plants are used in Indian Systems of Medicine such as *Ayurveda*, Homoeopathy, *Unani*, *Siddha*, etc<sup>1</sup>. In India, there are over 300 major tribal communities. Tribal population in Maharashtra is about 9 million which is 9% of general population. The concentration of tribal population occurs in remote areas of hilly regions of Northern, Western and Northwestern regions of Maharashtra. *Bhilla* is one of the major tribe and they are inhabited in Dhule, Jalgaon, Nandurbar districts of Maharashtra. The tribals have developed their own pharmacopoeia of their traditional knowledge about the medicinal uses of plants by trial and error methods. This pharmacopoeia has become cultural heritage of our nation. It is necessary to prepare and

preserve the digital data base of the traditional medicine for the benefit of present and future generations. A good deal of research work has been done on the inventorisation and documentation of traditional knowledge, especially plant based medicines used by the various tribes of India including Maharashtra<sup>2-14</sup>. But some of the tribes and tribal regions of Maharashtra have not received proper attention of researchers. *Bhilla* tribe in Maharashtra is one of them. In view of this, the survey of medicinal plants used by *Bhilla* tribe was undertaken.

### Methodology

For the collection of information on plants used as traditional medicine by the *Bhilla* tribe a questionnaire was prepared and before interviewing them Prior Informed Consent was taken from knowledge providers. For survey and collection of information and voucher plant specimens, field visits to settlements of *Bhilla* were undertaken. During the field visits, data on the medicinal uses of plants was collected from elderly persons, tribal heads, local medicine men called *vaidu* and *mukhia* of the tribal settlement at Adavad, Unapdeo in Jalgaon district,

\*Corresponding author

Table 1 — Plants used in traditional medicine by *Bhilla* tribe of Maharashtra

| Plant name (Family)/Local name  | Uses   |
|---|--|
| <b>Plants used for cough, cold and fever</b>  |  |
| <i>Achyranthes aspera</i> L. (Amaranthaceae)<br><i>Aghada</i>                                   | Whole plant is crushed, smashed in water and half cup of it is taken.  |
| <i>Anisochilus carnosus</i> (L.) Wall. (Lamiaceae)<br><i>Jirnya</i>                             | Root piece is chewed and eaten.  |
| <i>Balanites aegyptiaca</i> (L.) Del. (Balanitaceae)<br><i>Hingnbet</i>                         | Fruit powder is taken twice a day.   |
| <i>Cymbopogon citratus</i> (DC.) Stapf. (Poaceae)<br><i>Guvati chaha</i>                        | Decoction of leaves is taken twice a day.  |
| <i>Dendrocalamus strictus</i> (Roxb.) Nees.<br>(Poaceae) <i>Kalak, Velu</i>                     | Leaf infusion of with small amount of turmeric powder is given once a day.   |
| <i>Diplocyclos palmatus</i> (L.) Jeffr.<br>(Cucurbitaceae) <i>Kavdoli</i>                       | Powered seeds are put in water and half cupful water is taken; seed powder mixed in half cup milk is taken by mensuring woman.       |
| <i>Eclipta prostrata</i> L.<br>(Asteraceae) <i>Thiki fuli</i>                                   | Leaf paste is applied on wound and cuts; leaves are chewed and swallowed twice a day.  |
| <i>Tectaria macrodonta</i> C. Chr.<br>(Tectariaceae) Fern                                       | Plant powder is taken once a day.  |
| <b>Plants used for rheumatism/arthritis</b>   |  |
| <i>Adiantum philipense</i> L. (Adiantaceae)<br><i>Dondhari</i>                                  | Oil prepared from roots and seasoned in mustard oil and kerosene with pepper and onion is used for massage.                          |
| <i>Apium graveolens</i><br>(Apiaceae) <i>Owa, Ajwan</i>   | Powder of <i>ajwain</i> fruits and <i>Sagargota</i> seeds in equal proportion is taken twice a day after meals.                      |
| <i>Caesalpinia bonduis</i> (L.) Roxb. (Caesalpiniaceae)<br><i>Sagargota, Gaja</i>               | Powder of equal parts of <i>ajwain</i> fruits, <i>sunth</i> and <i>sagargota</i> seeds are taken after food.                         |
| <i>Celastrus paniculatus</i> Willd. (Celastraceae)<br><i>Malkanguni</i>                         | Seed oil is applied on the joints and gently massaged on painful joints.   |
| <i>Lygodium flexuosum</i> (L.) Sweet<br>(Lygodiaceae) (Fig. 3)<br><i>Ishwarjeet</i>             | <i>Bidi</i> made of root is smoked. Fresh roots boiled with mustard oil are used for massage. Powder of whole plant is taken.        |
| <i>Remusatia vivipara</i> (Roxb.) Schott.<br>(Araceae) (Fig. 1)<br><i>Piparkand</i>             | Paste of tuber is applied on joint once a day.   |
| <i>Withania somnifera</i> (L.) Dunal<br>(Solanaceae) <i>Dolro, Ashwaganda</i>                   | Plant powder in one cup of water is taken once a day.  |
| <i>Zingiber officinale</i> Rose.<br>(Zingiberaceae) <i>Sunth, Aale</i>                          | Powder of <i>sunth, ajwain (Apium graveolens)</i> fruits and seeds without seed coat of <i>sagargota</i> are taken in equal portion. |
| <b>Plants used for snake bite</b>   |  |
| <i>Aegle marmelos</i> (L.) Corr. (Rutaceae)<br><i>Bel</i>                                       | Leaf juice is applied on bitten part and squeezed leaves are eaten to avoid nausea.  |
| <i>Cassitha filiformis</i> L.<br>(Lauraceae) <i>Garwl</i>                                       | Infusion of aerial root and pendulous branches is given to reduce poisonous effect.  |
| <i>Commicarpus chinensis</i> L. (Nyctaginaceae)<br><i>Dogadfodi</i>                             | Roots are pounded in water and one glass of it is given for drinking. Vomiting takes place which helps in reducing poisonous effect. |
| <i>Cuscuta reflexa</i> Roxb. (Cuscutaceae)<br><i>Amarvel</i>                                    | To reduce the effect of poison one teaspoon of infusion of whole plant is given.   |
| <i>Cyphostemma auriculatum</i> (Roxb.) Singh & Shetty<br>(Vitaceae) <i>Tendop, Tedip</i>        | Bark is taken in one cupful of water once a day.   |
| <i>Radermachara xylocarpa</i> (Roxb.) K. Schum.<br>(Bignoniaceae) <i>Kharsing</i>               | Teaspoonful infusion of inner bank is given once a day to expel snake poison from the body.  |
| <i>Tinospora cordifolia</i> (Wild.) Miers ex<br>Hook.f.&Thom.<br>(Menispermaceae) <i>Gulvel</i> | Dried stem powder with lukewarm water is given.  |

Table 1 — Plants used in traditional medicine by *Bhilla* tribe of Maharashtra — *Contd*

| Plant name (Family)/Local name  | Uses  |
|---|---|
| <b>Plants used for scorpion bite</b>  |   |
| <i>Bauhinia racemosa</i> Lamk.<br>(Caesalpiniaceae) <i>Shida</i>                                    | Fruit paste and leaf juice is applied on stung part.  |
| <i>Brassica juncea</i> (L) Czern. & Coss. (Brassicaceae)<br><i>Rai, Mohari</i>                      | Juice of leaf, stem and branches is applied on stung part.  |
| <i>Carrisa congesta</i> Wight (Apocynaceae)<br><i>Karwand</i>                                       | Root piece of <i>karvand</i> is kept on molar tooth, chewed and its remnant is applied on stung part.                                       |
| <b>Plants used for burns/boils</b>  |   |
| <i>Abelmoschus ficulneus</i> (L.) Wt. & Arn. ex Wight<br>(Malvaceae) <i>Jangli bhendi</i>           | Root paste is applied on affected part.   |
| <i>Argyrea sericea</i> Dalz. and Gibs. (Convolvulaceae)<br><i>Gowel, Panvel</i>                     | Root paste is applied on the boils and other burnt portion.   |
| <i>Cryptocoryne retrospiralis</i> (Roxb.) Kunth<br>(Araceae) <i>Jalkand, Bebad kand</i>             | Fresh tuber paste is applied twice a day.   |
| <i>Cyphostemma auriculatum</i> (Roxb.) Singh & Shetty<br>(Vitaceae) <i>Tendop, Tedip</i>            | Bark is taken in one cupful of water.   |
| <i>Drimia indica</i> (Roxb.) Jescop (Liliaceae)<br><i>Janglikand</i>                                | Paste of bulb is applied on boils.  |
| <i>Eulophia rammentacea</i> Lindl.ex Wight<br>(Orchidaceae) <i>Kukad kand</i>                       | Lukewarm paste of tuber is applied on boils.  |
| <i>Lavandula bipinnata</i> O.Ktze<br>(Lamiaceae) <i>Gayand</i>                                      | Root paste is applied daily.  |
| <i>Mirabilis jalapa</i> L.<br>(Nyctaginaceae) <i>Gulbaksha</i>                                      | Root paste is applied on boils and leaf is tied on the boils.   |
| <i>Tacca leontopetaloides</i> (L.) O. Ktze. (Taccaceae)<br><i>Bamanzara</i>                         | Paste of tuber is applied on the boils and hairs on near by portion.  |
| <b>Plants used for leucorrhoea/menstrual complaint</b>  |   |
| <i>Ailanthus excelsa</i> Roxb. (Simaroubaceae)<br><i>Maharukh, Mahiling</i>                         | Bark decoction of <i>Maharukh</i> along with <i>Madhuca longifolia</i> and <i>Moringa oleifera</i> in equal proportion is given once a day. |
| <i>Catharanthus roseus</i> (L). G.Don.<br>(Apocynaceae) <i>Sadaphuli</i>                            | Leaf infusion is given once a day.  |
| <i>Clitoria ternatea</i> L. var. <i>pilosa</i> Wall. Ex. Baker<br>(Fabaceae) <i>Pandhara Gokarn</i> | During leucorrhoea, roots are pounded in water and one glass of it is taken.  |
| <i>Clitoria ternatea</i> L. var. <i>ternatea</i> (Fabaceae)<br><i>Neela Gokarn</i>                  | When there is red discharge, roots crushed/ pounded in water are given once a day.  |
| <i>Eriolaena candollei</i> Wall.<br>(Sterculiaceae) <i>Bothi</i>                                    | One cup infusion of inner bark is given once a day in the morning.  |
| <i>Mimosa pudica</i> L.<br>(Mimosaceae) <i>Lajalu</i>   | Roots are pounded in cold water and taken. Whole plant juice is put in nose once a day.   |
| <i>Ougeinia oojeinesis</i> (Roxb.) Hoibr.<br>(Fabaceae) <i>Kala palas</i>                           | Infusion of bark of <i>kala palas</i> and <i>biba</i> (in equal proportion) is taken.   |
| <i>Semecarpus anacardium</i> L.f.<br>(Anacardiaceae) <i>Biba</i>                                    | Bark infusion of <i>tiwas</i> , <i>ain</i> and <i>biba</i> (in equal proportion) is taken.  |
| <i>Terminalia elliptica</i> Willd.<br>(Combretaceae) <i>Ain</i>                                     | Bark infusion of <i>ain</i> , <i>biba</i> and <i>tiwas</i> (in equal proportion) is taken.  |
| <i>Cryptocoryne retrospiralis</i> (Roxb.) Kunth<br>(Araceae) <i>Jalkand, Bebad kand</i>             | Paste of fresh tuber is applied twice a day.  |
| <b>Plants used for stomach disorder/stomachache</b>   |   |
| <i>Aloe barbadensis</i> Mill.<br>(Liliaceae/ Aloeaceae) <i>Detki, Kawar</i>                         | Piece of leaf is warmed and tied on stomach once or twice a day.  |
| <i>Ceropegia hirsuta</i> Wt. & Arn. (Asclepiadaceae)<br><i>Khutti</i>                               | Fresh root is eaten every day. Whole plant decoction is taken once or twice a day.  |

*Contd—*

Table 1 — Plants used in traditional medicine by *Bhilla* tribe of Maharashtra — *Contd*

| Plant name (Family)/Local name  | Uses   |
|---|--|
| <i>Cicer aeriantinum</i> L.<br>(Fabaceae) <i>Chana/ Harbara</i>                                 | Young leaves are collected in the morning, squeezed to get sour juice ( <i>aamb</i> ) which is given orally once a day.          |
| <i>Cissampelos pareira</i> L. var. <i>hirsuta</i><br>(Menispermaceae) <i>Pahad mul, Pahdvel</i> | Powdered root infusion is taken once a day.  |
| <i>Wrightia tinctoria</i> R. Br.<br>(Apocynaceae) <i>Dahi Kudi kala- kuda</i>                   | Bark infusion is given twice a day.  |
| Plants used for tonic/general weakness  |  |
| <i>Chlorophytum borivillianum</i> Sant. & Fern.<br>(Liliaceae) <i>Safed musali</i>              | Fresh tuberous root or one teaspoonful of root powder is taken once a day.   |
| <i>Dioscorea alata</i> L.<br>(Dioscoreaceae) <i>Abhonya kand</i>                                | Tubers are eaten raw twice a day till weakness is reduced.   |
| <i>Firmiana colorata</i> (Roxb.) R. Br.<br>(Sterculiaceae) <i>Khavsa</i>                        | <i>Laddus</i> are prepared by mixing seed powder with wheat flour; one <i>laddu</i> every day is eaten for two weeks.            |
| <i>Hygraphila schulli</i> (Buch-Ham.) Mrs. & S.M.<br>Almeida (Acanthaceae) <i>Talimkhana</i>    | <i>Laddus</i> are prepared by mixing seed powder with wheat flour; daily one <i>laddu</i> is eaten.                              |
| <i>Panicum milliaceum</i> Linn.<br>(Poaceae) <i>Barati or Bhadali</i>                           | Grains are adaptogenic & never affected by pathogens or insects.   |
| <i>Sterulia urens</i> Roxb.<br>(Sterculiaceae) <i>Kadhai</i>                                    | Gum is eaten as it can be mixed in water.  |
| Plants used for contraceptive/antifertility   |  |
| <i>Curcuma longa</i> L.<br>(Zingiberaceae) <i>Haldi</i>   | Turmeric is taken with one glass of water twice a day.   |
| <i>Dioscorea bulbifera</i> L. (Dioscoreaceae).<br><i>Kadukand, Karanda</i>                      | Peeled, dried and powdered tuber is given once a day after menses.   |
| <i>Ficus religiosa</i> L.<br>(Moraceae) <i>Pimpal</i>   | Just before one week of menses, receptacles are taken along with local liquor.   |
| <i>Foeniculum vulgare</i> Mill.<br>(Apiaceae) <i>Badishep</i>                                   | Fruit powder is taken in one glass of water once a day in the morning after menses.  |
| <i>Trichosanthes tricuspidata</i> Lour.<br>(Cucurbitaceae) <i>Kaundal</i>                       | Seed powder mixed with water is given once a day for consecutive five days after menses.   |
| <i>Vitex negundo</i> L.<br>(Verbenaceae) <i>Nirgundi</i>  | To make man sterile, seed powder is given twice or thrice a day for about two weeks.   |
| Plants used for acidity/ulcer   |  |
| <i>Apium graveolens</i><br>(Apiaceae) <i>Owa, Ajwan</i>   | Powder of <i>ajwan</i> fruits and seeds of <i>sagargota</i> (in equal proportion) is taken twice a day, after meals.             |
| <i>Begonia crenata</i> Dryand. (Begoniaceae)<br><i>Khafadi</i>                                  | Juice of whole plant is given for 3-4 days.  |
| <i>Caeslpinia bondus</i> (L.) Roxb. (Caesalpiniaceae)<br><i>Sagargota, Gaja</i>                 | Powder prepared of equal parts of <i>ajwain</i> fruit, <i>sunth</i> and <i>sagargota</i> seeds are taken twice a day after food. |
| <i>Eranthemum roseum</i> (Vahl) R.Br.<br>(Acanthaceae) <i>Thandikarav</i>                       | Root infusion is taken twice a day.  |
| <i>Limonia acidissima</i> L.<br>(Feronia elephantum)<br>(Rutaceae) <i>Kavath</i>                | Leaf powder in one cup of water is taken once or twice a day.  |
| <i>Triumfetta malabarica</i> Koen. ex. Rottb. (Tiliaceae)<br><i>Pivala leptta, zila</i>         | Root infusion is given twice a day.  |
| Plants used for dysentery   |  |
| <i>Bombax ceiba</i> Linn. (Bombacaceae)<br><i>Katesavar</i>                                     | Infusion of <i>savar</i> bark and <i>Kharbat</i> ( <i>Grewia tileafolia</i> ) fruits is taken twice a day.                       |
| <i>Citrus aurantifolia</i> (Christ. and Panz.) Swingle<br>(Rutaceae) <i>Limbu</i>               | Leaves of <i>tulsi</i> and seeds of <i>citrus</i> are taken together and its juice is given twice a day.                         |

Table 1 — Plants used in traditional medicine by *Bhilla* tribe of Maharashtra — *Contd*

| Plant name (Family)/Local name  | Uses  |
|---|---|
| <i>Dendrophoe falcata</i> (L.f.) Etting (Loranthaceae)<br><i>Menda, Bandgul</i>                       | Leaf paste put in water is filtered and water is collected. Equal amount of milk is added to it and one cup of it is taken.                                   |
| <i>Ocimum gratissimum</i> L.<br>(Lamiaceae) <i>Ran Tulshi</i>   | Leaves of <i>tulasi</i> and <i>limbu</i> are taken together and its juice is given twice a day.   |
| <i>Ocimum tenuiflorum</i> L.<br>(Lamiaceae) <i>Tulshi</i>   | Leaves of <i>tulshi</i> & seeds of citrus are taken together and its juice is given twice a day.  |
| <i>Rhynchosia rufescens</i> (Wild.)DC.<br>(Fabaceae) <i>Walmoyada</i>                                 | Roots paste in water is filtered through cloth and one cup of the filtrate is given once a day.   |
| <b>Plants used for abortion</b>   |   |
| <i>Carica papaya</i> L.<br>(Caesalpiniaceae) <i>Payaya, Horunkakdi</i>                                | Latex of young fruits is dried and given with half cup of cow milk twice a day.   |
| <i>Dolichandrone falcata</i> (Wall. ex DC) Seem<br>(Bignoniaceae) <i>Medisinghi</i>                   | Fruit juice is taken once or twice to expel foetus of less than four months.  |
| <i>Leea macrophylla</i> Roxb. Ex Horn.<br>(Vitaceae/Leeaceae)   | Pieces of rhizome and tuberous roots are roasted and eaten to expel foetus.   |
| <i>Ruellia tuberosa</i> L.<br>(Acanthaceae) <i>Konsuda</i>  | Root paste is inserted in vagina and kept for overnight; it causes bleeding & foetus is expelled out.   |
| <b>Plants used for wounds</b>   |   |
| <i>Cardiospermum helicacabum</i> L. (Sapindaceae)<br><i>Kapalphodi, phatakdi</i>                      | Leaf juice is put on the cut part for stopping bleeding.  |
| <i>Eclipta prostrata</i> L.<br>(Asteraceae) <i>Thiki fuli</i>   | Leaf paste is applied on wound and cuts. Leaves are chewed and swallowed.   |
| <i>Discorea hispida</i> Dennst.<br>(Dioscoreaceae) <i>Vajkand</i>                                     | Tubers are roasted, pounded and its paste is applied on wounds and injuries.  |
| <i>Erythrina variegata</i> L.<br>(Fabaceae) <i>Pangara</i>  | Bark paste is applied on wound; within 2-3 days wound is healed.  |
| <i>Lygodium flexuosum</i> (L.)Sweet<br>(Lygodiaceae) (Fig.3)<br><i>Ishwarjeet</i>                     | Smoking <i>bidi</i> made of root. Fresh roots boiled with mustard oil are used for massage. Powder of whole plant is taken.                                   |
| <i>Mallotus philipensis</i> (Lam.)Muell-Arg.<br>(Euphorbiaceae) <i>Shendri</i>                        | Paste of bark is applied on wound. It stops blood and acts as antiseptic also.  |
| <i>Millettia extensa</i> (Bth.) Baker<br>(Fabaceae) <i>Agrivel</i>                                    | Bark is pounded in water and juice is applied once a day for 4-5 days.  |
| <i>Tridax procumbens</i> L.<br>(Asteraceae) <i>Kadvaya Khod</i>                                       | If skin is cut by any external means, leaf juice is applied on it. Blood clotting takes place and wound also heals early.                                     |
| <b>Plants used for other diseases/ailments</b>  |   |
| <i>Actinopterys dichotoma</i> (Sw.) Link. (Filicinae)<br><i>Bhuitad, Hevicarav</i>                    | For kidney trouble (oedema), whole plant extract is given once a day for 7-8 days.  |
| <i>Aerides maculosum</i> Lindl. (Orchidaceae)<br><i>Menda-Orchid</i>                                  | During tuberculosis, root infusion is given once a day for one to two months.   |
| <i>Amaranthus spinosus</i> L. (Amaranthaceae)<br><i>Kantabhaji, Katemaat</i>                          | Root paste with coconut oil is applied during migraine.   |
| <i>Anogeissus latifolia</i> (Roxb. ex. DC) Wall, ex. G. & Perr. (Combretaceae) <i>Dhaoda, Dhamoda</i> | Infusion of bark is given once or twice a day for easy delivery.  |
| <i>Arisaema tortuosum</i> (Wall.) Schott and Endl.<br>(Araceae) <i>Chandya Kand</i>                   | For hair follicle infection, tuber paste is applied twice a day till relief.  |
| <i>Aristolochia bracteata</i> Lam. (Aristolochiaceae)<br><i>Kidamar</i>                               | For curing leprosy, leucoderma, cardiac debility, cholera and bowel complaints, root powder and root decoction is used. Leaf juice or decoction is also used. |
| <i>Asparagus racemosus</i> Willd. (Asparagaceae-Liliaceae) <i>Shataver</i>                            | For increase lactation, a cupful juice of fresh tuberous roots with sugar is taken twice a day.   |

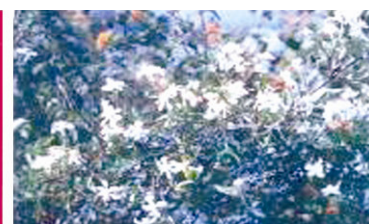
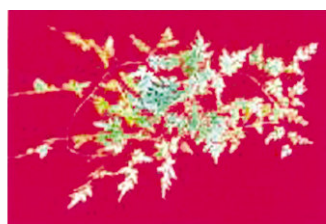
Table 1 — Plants used in traditional medicine by *Bhilla* tribe of Maharashtra — *Contd*

| Plant name (Family)/Local name  | Uses  |
|---|---|
| <i>Bauhinia purpurea</i> L. (Caesalpiniaceae)<br><i>Apta, Kanchan</i>                                 | For the treatment of white spot on face, one cup infusion of small piece of root is given once a day for one week.  |
| <i>Biophytum sensitivum</i> (L.) DC. (Oxalidaceae)<br><i>Jangli lajalu</i>                            | Leaves of <i>lajalu</i> and seeds of ground nut are crushed and eaten twice a day by the pregnant women as diuretic.  |
| <i>Begonia crenata</i> Dryand. (Begoniaceae)<br><i>Khafadi</i>  | One two teaspoonful juice of whole plant is given 2-3 times a day during acidity.   |
| <i>Borassus flabelifer</i> L.<br>(Araceae-Palmae) <i>Shindoli, Tad, Tadi</i>                          | For increase lactation, latex of <i>payer</i> and <i>sabar</i> mixed with roots of <i>tadi</i> crushed together is given for one week.                            |
| <i>Cardiospermum helicacabum</i> L. (Sapindaceae)<br><i>Kapalphodi, phatakdi</i>                      | Leaf juice is put on the cut part of wounds for stopping bleeding.  |
| <i>Cassia fistula</i> L. (Caesalpiniaceae)<br><i>Bahava, Kerwalo</i>                                  | Fruit is soaked in water and pulp is taken out; drops of pulp extract are put in the ear once or twice a day during earache.                                      |
| <i>Cassia occidentalis</i> L.<br>(Caesalpiniaceae) <i>Rantakla, Takla, Tarwad</i>                     | Mixture of root and seed paste is applied on scalp sores of babies.   |
| <i>Celosia argentea</i> L. (Amarantaceae)<br><i>Kurdu, Dkhrudo</i>                                    | For treating semen in urine, root infusion is taken once a day in empty stomach.  |
| <i>Cheilanthes albomarginata</i> Clarke<br>(Cheilanthaceae) <i>Morjiva</i>                            | During chest pain, whole plant decoction is taken once or twice a day.  |
| <i>Cheilanthes farinosa</i><br>(Forsk.) Kaulf (Cheilanthaceae) <i>Morjiva</i>                         | During chest pain, whole plant decoction is taken once or twice a day.  |
| <i>Cissus quadrangularis</i> L. (Vitaceae)<br><i>Hadsandhi</i>  | Stem paste is applied on fractured bone or swollen part for 4-5 days.   |
| <i>Citrullus colosynthies</i> (L.) Shrad (Cucurbitaceae).<br><i>Kadu indrayan</i>                     | During malaria, fruit decoction is given twice a day.   |
| <i>Clematis gouriana</i> Roxb. ex. DC. (Ranunculaceae)<br><i>Morvel, Moryel</i> (Fig.4)               | Stem and leaf infusion is taken once a day for throat ache and voice problem.   |
| <i>Cocculus hisutus</i> (L.) Theob.<br>(Menispermaceae) <i>Vasanvel, Karrom</i>                       | For treating conjunctivitis, leaf paste is applied on eye lids like potis.  |
| <i>Curculigo orchioides</i> Gaertn. (Hypoxidaceae)<br><i>Kalimusali, Kanmodi</i>                      | During leucorrhoea, root infusion is given twice a day.   |
| <i>Datura metel</i> L.<br>(Solanaceae) <i>Kala dhotra</i>   | During swelling due to smash without external wound, leaf by applying little oil is warmed on fire and tied on swelling.  |
| <i>Euphorbia ligularia</i> Roxb.<br>(Euphorbiaceae) <i>Saber</i>                                      | For increase lactation, latex of <i>saber</i> , <i>payer</i> and roots of <i>tadi</i> mixed and given once a day for about week. It increases lactation in women. |
| <i>Emblica officinalis</i> Gaertn<br>(Euphorbiaceae) <i>Amla</i>                                      | During diabetes, seed powder is taken once or twice day for a week.   |
| <i>Ficus amplissima</i> J. E. Smith<br>(Moraceae)<br><i>Pimpari, Payar</i>                            | For increase lactation, latex of <i>payer</i> and <i>sabar</i> mixed with roots of <i>tadi</i> crushed together is given for one week.                            |
| <i>Ficus hispida</i> L.f.<br>(Moraceae) <i>Kala Umber</i>   | During migraine (religious), root piece is tied on the ear of the affected side of the head.  |
| <i>Flacourtia indica</i> (Burm f.) Merr.<br>(Flacourtiaceae) <i>Parhenkal</i> (Fig.2)                 | Epicarp of fruit is removed and crushed in warm water is applied on joints during arthritis.  |
| <i>Garuga pinnata</i> Roxb.<br>(Burseraceae) <i>Kakad</i>   | During inflammation, bark paste is applied and fomented with warm water.  |
| <i>Grewia tillifolia</i> Vahl<br>(Tiliaceae) <i>Kharmati</i>  | Root powder infusion is taken once a day as anti-abortionificient.  |
| <i>Gymnema sylvestre</i> (Retz) R.Br. ex Schult.<br>(Asclepiadaceae)<br><i>Dashmul, Bedkicha pala</i> | During diabetes, fresh leaves are eaten.  |
| <i>Haldina cordifolia</i> (Roxb.) Ridsd.<br>(Rubiaceae) <i>Haldu</i>                                  | Latex is applied on aching tooth / gums.  |
| <i>Helecteres isora</i> L.<br>(Sterculiaceae) <i>Murudsheng Ati</i>                                   | For treating leucoderma (white spot on skin), root infusion is given once a day.  |

Contd—

Table 1 — Plants used in traditional medicine by *Bhilla* tribe of Maharashtra — *Contd*

| Plant name (Family)/Local name  | Uses   |
|---|--|
| <i>Jatropha curcas</i> Linn.<br>(Euphorbiaceae) <i>Parsha Erand</i>                               | During muscular pain, paste of bark powder applied on affected part and wrapped with cloth till one gets relief.   |
| <i>Lygodium flexuosum</i> (L.) Sweet<br>(Lygodiaceae) <i>Ishwarjeet</i> (Fig.3)                   | For bleeding gum, bad breath, sprains, scabies, rheumatism, antifertility agent, abortifacient, jaundice, wound healing, <i>bidi</i> made of root is smoked. Fresh roots boiled with mustard oil are used for massage. Powder of whole plant is taken. |
| <i>Modhuca longifolia</i> (Koen.) Macbr. var. <i>latifolia</i><br>(Sapotaceae) <i>Moha, mahua</i> | Extract of dried flowers is applied on hairs to promote hair growth.   |
| <i>Mentha spicata</i> L. ( <i>M. arvensis</i> )<br>(Lamiaceae) <i>Pudina</i>                      | During jaundice, fresh leaves are crushed and applied on eyes, surface of foot and all over body.  |
| <i>Nervilia aragoana</i> Gaud<br>(Orchidaceae) <i>Arubat Kand</i>                                 | During headache, tuber paste is applied on forehead ones a day till relief.  |
| <i>Ocimum tenuiflorum</i> L.<br>(Lamiaceae) <i>Tulshi</i>   | Leaves of <i>tulshi</i> & seeds of citrus are taken together and its juice is given during dysentery.  |
| <i>Plumbago zeylanica</i> L.<br>(Plumbaginaceae) <i>Chitrak</i>                                   | Powder of <i>chitrak</i> seeds, <i>Cyperus rotundrus</i> rhizome and <i>Psoralea</i> sp seeds in equal proportion mixed in <i>til</i> oil is applied on affected part of leucoderma.   |
| <i>Pogostemon benghalensis</i> (Burn.f.) O.ktze.<br>(Lamiaceae) <i>Phangla</i>                    | Putting leaf juice on dried gum of <i>Sturculia urens</i> , fried with <i>til</i> oil, becomes black is taken in empty stomach for treating piles.   |
| <i>Pterocarpus marsupium</i> Roxb.<br>(Fabaceae) <i>Bilwas or Bija</i>                            | Powder of small pieces of wood is kept in water in copper glass overnight; filtered water is taken once a day during diabetes.   |
| <i>Pterospermum diversifolium</i> Bl.<br>(Sterculiaceae) <i>Padal</i>                             | If cattle are not eating fodder due to stomach inflation, the leaves are crushed or cut into pieces and given as fodder.   |
| <i>Ricinus communis</i> L.<br>(Euphorbiaceae) <i>Ondo, Erand</i>                                  | Paste of roots of <i>erand</i> and <i>kumbhi</i> ( <i>Careya arborea</i> ) in water juice is given once or twice for treating red urination.   |
| <i>Rivea hypocrateriformis</i> (Desr.) Choisy<br>(Convolvulaceae) <i>Phangyel</i>                 | During sexual weakness, whole plant powder is taken in one cup of milk once a day.   |
| <i>Solanum virginianum</i> L.<br>( <i>S. xanthocarpum</i> ) (Solanaceae) <i>Katerinagni</i>       | Fruits are dried, powdered and one teaspoonful of powder is given once a day for about a week in case of asthma.   |
| <i>Sterculia villosa</i> Roxb. ex Dc.<br>(Sterculiaceae) <i>Sardol</i>                            | Fresh roots are eaten twice a day to overcome weakness and male sterility.   |
| <i>Swertia densiflora</i> (Griseb) Kashyap<br>(Gensianaceae) <i>Kaduphang</i>                     | Roots are pounded in water & juice is taken once a day during leprosy.   |
| <i>Terminalia chebula</i> Retz.<br>(Combretaceae) <i>Hirda</i>                                    | Decoction of fruits is taken once or twice a day for the treatment of excess heat in the body.   |
| <i>Tylophora fasciculata</i> Buch.-Ham.<br>(Asclepiadaceae) <i>Wata chira</i>                     | In case of woman infertility, root infusion is given.  |
| <i>Verbascum chinense</i> (L.) Sant.<br>(Scrophulariaceae) <i>Kali-Kutaki</i>                     | During piles, powder of leaves and seeds is given in cupful of water, twice a day till it is cured.  |

Fig. 1 *R. vivipara* Roxb.Fig. 2 *F. indica* (Burm. F.) Merr.Fig. 3 *L. flexuosum* (L.) SweetFig. 4 *C. gouriana* Roxb. Ex DC.

Sarankheda, Lekhapani, Kundipada in Nandurbar district and Ranipur, Shirpur in Dhule district. The informers accompanied in the field helped in locating and collection of voucher plant specimens.

Herbarium of voucher plant specimens were prepared, identified and deposited in the Herbarium of Botany Department of Yashwantrao Mohite College, Pune<sup>3</sup>.

### Results and discussion

During the survey, plant and plant parts used as medicine by the *Bhilla* tribe in Maharashtra for the treatment of various ailments have been explored. Analysis of the data revealed that a total number of 127 species belonging to 116 genera and 59 families of flowering plants and ferns are used as medicine in the healthcare treatment (Table 1). The number of plant species used by the tribe for curing some of the important and common diseases, shown in the parenthesis, are as follows-stomachache/abdomen pain (8) cough, cold, fever (8), rheumatism/arthritis (9), snake bite (7) scorpion bite (3) contraceptive (6) acidity/ulcer (6) menstrual complaints (9) dysentery (6) abortifacient (4), wounds (6), lactation in woman (4) piles (3) diabetes (3) burns (2) boils (6) bone fracture, etc. The tribal settlements are generally in remote areas of forest and there is prevalence of common diseases like stomach disorders, cough, cold, fever, dysentery, eye problems, wounds, boils, scorpion bite, snake bite, bone fracture, etc. The prevalence of diseases can be attributed to unhygienic conditions, poor quality of food, lack of clean drinking water and continuous exposure to the environment. In addition, tribals do not get in time and proper treatment even for common diseases. Therefore, for the treatment, they mostly rely on easily available traditional herbal medicines. It is also observed that the dose or administration of the drug, i.e. quantity of extract, decoction, infusion or powder to be taken is based only on approximation, and is not standardized. Therefore, to prove efficacy of any crude drug, it is very essential to standardize the dosage or administration and also authenticate the sourcing plant species of the drug. There is also need for maintaining precise clinical records of the study of plant extract, adverse drug reaction if any, etc. which will help in drug standardization. The flora of Maharashtra especially Western Ghats is very rich and provides very good source of many medicinal plants used as traditional medicine.

### Acknowledgement

Authors are grateful to Prof Shivajirao Kadam, Vice Chancellor, Bharati Vidyapeeth University, Principal KD Jadhav, Yashwantrao Mohite College,

Principal Dr AV Joshi, Bharati Vidyapeeth College of Ayurveda and Prof Dr Bhushan Patwardhan, Director, School of Health Sciences, University of Pune for encouragement and facilities. Senior author is thankful to University Grants Commission, for financial assistance. Authors wish to thank all knowledge providers for providing valuable information about plants and medicinal uses.

### References

- 1 Puspangadan P, *Ethnobotany in India: A status report*, (Government of India, New Delhi), 1995.
- 2 Upadhye A, Vartak V D & Kumbhojkar MS, Ethno-medico-botanical studies in western Maharashtra, India, *Ethnobotany*, 6 (1994) 25.
- 3 Jain S K, *Glimpses of Indian Ethnobotany*, (Oxford and IBH Publication New Delhi), 1981.
- 4 Jain S K, Ethnobotany in Modern India, *Phytomorphology*, 51 (2001) 39-54.
- 5 Vartak V D & Gadgil M, Studies on ethnobotany-a new vista in botanical science, *Biovigyanam*, 7 (1980) 145-148.
- 6 Malhotra S K & Moorthy S, Some useful medicinal plants of Chandrapur district- Maharashtra, *Bull Bot Surv India*, 15 (1973) 13.
- 7 Tribhuvan R & Peters P, Medico-ethno-biology of the *Katkaries* and *Thakars*, *Tribal Res Bull*, 14 (1) (1992) 20-24.
- 8 Janardhanan K P, An enumeration of medicinal plants of khed taluka, (Maharashtra), *Bull Bot Surv India*, 5 (1963) 363-374.
- 9 Kamble S Y & Pradhan S G, Ethnobotany of the *Korkus* in Maharashtra, *Bull Bot Surv India*, 22 (1-4) (1980) 202.
- 10 Padhey M D & Tiwari V J, Ethnobotanical study of the *Korku* tribe of Amravati district, Maharashtra state, India, *Pharmacognosy*, 29 (2) (1991) 1-4.
- 11 Rajput AP & Yadav S, Medico-botanical and phytochemical studies on medicinal plants of Dhule and Nandurbar districts of Maharashtra State, *J Phytol Res*, 13 (2) (2000) 161-166.
- 12 Chaudhary K K, Studies on medicinal plants of chikali (Buldhana district) with special reference to some aspects of ethnobotany, In: *Herbal Medicines, Biodiversity and Conservation Strategies*, (International Book Distributors, Dehradun), 1995, 132-158.
- 13 Tiwari V J, Padhye M D & Makade K H, Ethnobotanical study of *Kawar* tribe of Gadchiroli district of Maharashtra State, In: *Herbal Medicines Biodiversity & Conservation Strategies*, (International Book Distributors, Dehradun), 1995, 160-173.
- 14 Yadav SS & Bhamre PB, Ethno-medico-botanical studies of Dhule forest in Maharashtra state (India), *J Econ Tax Bot*, 13 (2) (1989) 455-460.
- 15 Jain S K & Rao R R, *Field and Herbarium Methods*, (Today and Tomorrows Publication, New Delhi), 1976.